

Introduction

There are literally trillions of dollars of face value of swaps embedded in securitisation and covered bond structures globally. These embedded swaps – which we shall call *securitisation swaps* – have several highly distinctive features that make them quite different from other derivatives. Despite these differences and the sheer size of the market, securitisation swaps have long been neglected in both the practitioner and academic literature.

Amongst the participants of structured funding markets the emphasis is (rightly) on the funding task for originators and the relative value proposition for investors. Much attention and discussion are lavished on the size of the coupon on residential mortgage-backed securities (RMBS), asset-backed securities (ABS) and covered bonds and whether it is tighter or wider than recent comparable issuance. Yet for originators the key metric is not the coupon but rather the landed cost of funds, that is the cost of funding once all expenses, including swap fees, are included.¹ This is almost never publicly disclosed – but that certainly does not diminish its central importance. In this vein, securitisation swaps deserve more prominence as they are, in many cases, a material proportion of the overall funding cost.

In addition to impacting the landed cost of funds, securitisation swaps incorporate new risks and complexity into structured funding transactions. For instance, a credit rating downgrade of the swap provider can, in certain circumstances, lead to a downgrade of the associated bonds without any change in the creditworthiness of the underlying loan pool. Securitisation swaps can also be a significant impediment to restructuring deals,² which can blindside investors who aren't fully aware of the consequences of having swaps embedded in structured funding deals.

It therefore makes good sense for practitioners to understand how securitisation swaps are priced, what risks they carry and how the price and risk varies across the

¹For banks, who must hold credit risk capital against loans on their balance sheet, the landed cost of funds should also include the cost of capital *savings* from transferring securitised loans off their balance sheets. This does not apply to non-bank originators.

²For example, the Federal Reserve Bank of New York's Maiden Lane III portfolio of legacy AIG assets faced these problems. See <https://tinyurl.com/y9bmg7c6>.

myriad structuring options. As for any financial instrument, the pricing depends on the qualitative and quantitative nature of the risks being transferred. So, understanding the risk management of securitisation swaps by those who provide them is useful knowledge. It is the authors' contention that having a deeper understanding of the structuring, pricing and risk management of securitisation swaps will be of great benefit to everyone involved in structured funding, whether directly or as a service provider.

What makes securitisation swaps different? Securitisation swaps are different because they are inextricably linked to the inner workings of the underlying structured funding. The dynamics of the underlying loan pool and cash flow waterfalls – which are usually highly tailored – need to be incorporated in to the modelling of the swaps. This is in contrast to derivatives used by corporations, fund managers and other entities to manage risk. For example, consider a fund manager who owns USD200 million of offshore assets and hedges them back to domestic currency with foreign exchange (FX) forwards. It doesn't matter if the offshore asset is a portfolio of stocks or a power station, the FX forward is a simple currency risk management overlay, which can be easily bolted-on. In contrast, securitisation swaps are not bolted-on, but *embedded*.

The embedding of swaps in securitisation and covered bond structures is designed to remove market risk from funding deals. When underlying cash flows change, whether due to prepayment rates in the loan pool, a trigger feature in a cash flow waterfall or the originator hasn't called its bonds at a call date, any associated securitisation swap will have its cash flows altered in lockstep. This de-risking of structured funding enables the issuance to receive a very high credit rating – often AAA – from credit rating agencies. In turn, these very high ratings enable structured funding to be a highly efficient form of funding for banks and non-bank lenders.

Imagine if a securitisation swap was not in place on a structured funding issuance into, say, US dollars (USD) from a sterling (GBP) denominated loan pool. The currency volatility would expose the US investors to significant potential loss without any deterioration in the credit risk of the underlying pool of assets. For example, in 2008, GBP plunged 30% in value from buying around 2.00 to 1.35 USD in a matter of months. Removing this currency risk is an absolute necessity for any issuer hoping to achieve a AAA rating on such bonds. Likewise for interest rate risk and other market risks. But market risk can only be *totally* removed if the swap provides a *perfect hedge* – and this requires the swap cash flows to be in total alignment with the underlying cash flows from the structured funding vehicle.

Of course, the converse of the de-risking of structured funding deals is that the provider of the swap is assuming those risks. It goes without saying that anyone assuming such complex cross-asset risks needs to have significant expertise or else they could incur very material financial losses and risk management pain. This is equally true no matter whether the swap provider is also the originator or whether it is a third-party provider.

The risks from providing a securitisation swap are complex because there are multiple moving parts. Not only are the underlying cash flows subject to change, but markets are moving at the same time, specifically spot FX rates, interest rates and basis curves. The good news and key message of this book is that rigorous modelling and a wide variety of risk-mitigating structures can tame these complex risks. In this regard, the swap structuring techniques described in this book, and the legal mechanisms to incorporate them into deals, are just as important as the quantitative modelling. A thorough understanding of risk-mitigating structures for securitisation swaps should be an important part of the toolkit for anyone involved in structured funding.

We devote an entire chapter to each of the three key distinctive risks of securitisation swaps. Chapter 5 is dedicated to **swap prepayment risk**. This is the risk of simultaneously adverse moves in both loan pool prepayment rates and market risk factors. Swap prepayment risk is more complex than prepayment risk since it is concerned with the consequential impact of prepayment risk *together with changes in market risk factors* on derivatives valuation.

Chapter 6 concentrates on **swap extension risk**. This is the risk that the weighted average life (WAL) of the underlying ABS, RMBS or covered bond may extend, causing associated securitisation swaps to also extend. Extension events can be caused by originators not calling their bonds as expected (for securitisations) or by an issuer event of default (in the case of covered bonds). Extension risk is concerned with a single low probability, high impact event. In contrast, swap prepayment risk is concerned with a series of high probability, low impact events.

Chapter 7 is devoted to **downgrade risk**. Downgrade risk arises from swap providers having to comply with strict obligations linked to their own credit ratings. These obligations are defined by the rating agencies and arise from the fact that swap providers are usually rated lower than the structured funding they are supporting. The obligations are designed to de-link the swap provider's rating from that of the structured issuance. Downgrade risk consists of two underlying risks: (i) the risk of posting collateral one-way if its own credit rating falls to a prespecified trigger level; and (ii) the risk of being forced to novate out of a swap if its credit rating falls to a (lower) prespecified trigger level. Both events can be costly. The risk of posting collateral also entangles securitisation swaps with Basel III liquidity regulation and requires a new derivative valuation adjustment (yet another XVA!) to account for it.

This book is intended for a wide audience – for everyone involved in structured funding in some capacity. This includes originators, sponsors and arrangers, investors, swap providers, rating agencies and regulators. Relevant staff at swap providers includes derivative structurers, sales, traders, quants, risk managers, lawyers, product controllers and system developers. This book focuses primarily on swaps in structured funding transactions where the underlying debt is residential mortgages in predominantly floating rate markets (such as Australia and the UK), auto loans or

credit card receivables. Nevertheless, much of the content of this book will still be broadly applicable, with some modification, to other underlying asset classes such as corporate loans, commercial real estate and student loans, and to other jurisdictions.

The book can be referred to in discrete parts or read cover-to-cover. Readers with a strong background in securitisation can skip Chapters 2 and 3 and begin with the discussion on swaps in Chapter 4. Readers with a derivatives background, but little or no securitisation knowledge, should start at Chapter 2 where they can learn about securitisation quickly, with the material tailored to build a foundation for *securitisation swaps* specifically. Worked numerical examples are available in a spreadsheet on this book's website at www.securitisationswaps.com.